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(54) **Method of making a label with adhesive-free lifting portion.**

(57) A method of making a label-equipped sheet in which a release liner (16) has one face thereof equipped with pressure sensitive adhesive (18) and adhered to one surface of a base stock sheet (11), the base stock sheet being die cut in a closed perimeter with in the confines of the release liner, the die cutting including a generally linear segment (22) which is adjacent an area of the release liner free of adhesive to provide readily finger engageable portion of the label, the adhesive-free area being provided by either interrupting the application of the adhesive to the liner or by removing the already applied adhesive by removing a die cut strip of the base stock.

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BACKGROUND AND SUMMARY OF INVENTION:

This invention relates to a method of making a label-equipped sheet and, more particularly, to a sheet or form wherein the label is die cut from base stock constituting the sheet and held in place by a pressure sensitive adhesive-equipped release liner until needed for use.

It has become increasingly desirable to provide sheets generally and business forms particularly of minimal thickness for ease in processing through computer printers, especially table top personal computers with associated printers. One approach to achieve this has been to die cut the form itself to provide a removable label. This art is well known for die cut labels generally in Patents 3,914,483 and 4,246,058 and for business forms in Patents 4,379,573 and 5,011,559.

However, with the processing of sheets such as business forms through printers and the subsequent converting of the connected forms into a roll or a zig-zag pack, it has become increasingly difficult to remove the label from the form.

According to the invention, an area of the release liner adjacent one longitudinally-extending segment of the die cut is provided free of adhesive. This then provides a readily finger-nail liftable unattached portion of the label.

The concept of omitting adhesive along an edge of an attached member is well known in the art as exemplified by Patents 3,926,113; 4,526,405 and 4,664,416. Notwithstanding this prior art teaching, the art has not seen fit to provide a method for making a finger engageable longitudinally extending portion in a label die cut in a sheet, particularly a business form.

The details of the inventive method and construction can be seen in the ensuing specification.

BRIEF DESCRIPTION OF DRAWING:

The invention is described in conjunction with the accompanying drawing, in which --

FIG. 1 is a fragmentary top plan view, partially in perspective of a continuous web such as business form string featuring one version of the invention;

FIG. 2 is an enlarged sectional view such as would be seen along the sight line 2-2 applied to FIG. 1;

FIG. 3 is a side elevational view (essentially schematic) of apparatus employed in the practice of the inventive method;

FIG. 4 is a fragmentary perspective view of a nozzle advantageously employed in the practice of the invention;

FIGS. 5 and 6 are views similar to FIG. 1 but showing modified versions of the invention;

FIG. 7 is an enlarged sectional view such as would be seen along the sight line 7-7 applied to FIG. 6; and

FIG. 8 is a view similar to FIG. 3 but for the practice of the invention in connection with the FIG. 6 version.

DETAILED DESCRIPTION:

Referring to FIG. 1, the numeral 10 designates generally a string of interconnected business form lengths of the general type seen in co-owned Patent 4,664,416. One form length is designated 11 with the adjacent preceding length being designated 11a and the following length 11b. It will be understood that the form lengths are produced continuously and conveniently converted to rolls or zig-zag folded packs for shipment. Lines of transverse perforation 12 define the ends of each form length. The entire string is equipped with line holes 13 defining a control punch margin 14 at least along one longitudinally extending side 15. Normally, however, line holes and therefore control punch margins, are provided along both longitudinal sides for better control of the web during both manufacture and subsequent processing through the computer printer -- as seen in the '416 patent. However, for simplicity of presentation, the other control punch margin has been omitted from FIG. 1 and when the base stock web is just a sheet, both margins are usually omitted, as would be the case with snap-out forms.

The form length 11 is equipped with a release liner 16 (usually a silicone coated ply) which can be better appreciated from a consideration of FIG. 2. There, the release liner ply 16 has one face 17 equipped with pressure sensitive adhesive 18 and adhered to one surface 19 of the generally rectangular form length of sheet 11. The adhesive 18 is provided in two spaced apart areas 20 and 21 (see FIG. 2) to provide a band 22 where there is no adhesive on the liner ply 16 and therefore no adhesive on the confronting surface 19 of the form sheet 11. It will be appreciated that the adhesive will transfer with the sheet 11 when the sheet and liner are separated.

In FIG. 1, a label generally designated 23 is provided by a closed perimeter die cut 24 in the form sheet 11 and one segment 25 of the closed perimeter die cut 24 is aligned with, i.e., overlies the band 22 -- see also FIG. 2. Thus, a readily finger liftable unattached portion of the label is provided as seen in the lower left in FIG. 1.

It is believed that the invention can be better understood by describing the method of producing the label equipped form and this is set forth following in connection with FIGS. 3 and 4.

The Inventive Method

Referring first to FIG. 3, the symbol W designates a web proceeding along a longitudinally extending path designated by an arrow P. The path normally is provided by side frames (not shown) and which carry the various processing rolls. Provided adjacent the path P is a roll 26 of release web material such as the previously mentioned siliconed ply. The liner ply 27 is unwound from the roll 26 by means of an infeed 28 consisting of draw rolls and proceeds past a nozzle 29 for applying pressure sensitive adhesive to the face 17 thereof.

Thereafter, the liner ply 27 passes around a vacuum roll 30 for engagement with a knife 31 of a cutoff roll 32. By rotating the vacuum cylinder 30 at a speed faster than the speed of the liner ply 27, spaced apart patches 16 of liner material are applied to the web W being advanced along the longitudinal path P.

Downstream of the point at which the patches or plies of liner material 16 are applied to the web W, the web W is subjected to a die cutting operation as at 33. This is brought about by the operation of a knife roll 34 bearing against an anvil roll 35 so as to cut the closed perimeter 24 only in the web W and not in the liner patch 16. It will be appreciated that the closed perimeter die cut 24 is within the confines of the release liner 16 -- see FIG. 1.

The band 22 wherein the liner ply 16 and web W are not equipped with pressure sensitive adhesive 18 is advantageously developed through the use of the nozzle 29 seen in FIG. 4. There, the nozzle has a relatively elongated outlet 36 which intermediate its length is blanked off by blanking means 37 so as to develop the spaced apart areas of adhesive 20, 21.

In summary, by providing a split stream of adhesive 18 to provide two spaced areas, 20, 21, a non-covered band 22 is provided in a series of equally longitudinally spaced liners 16. The closed perimeter die cut 24 has a line segment 25 overlying the uncovered band 22 so as to provide the finger liftable portion generally designated F in FIG. 1.

Version of FIG. 5

The showing in FIG. 5 differs essentially from that of FIG. 1 in having a continuous liner ply 116 applied to the form lengths 111, 111a, 111b, etc. This is readily achieved by passing the liner ply 116 directly from the adhesive applying unit to the web W -- without the transverse cutting and speed-up provided by the vacuum cylinder 30 and cutoff roll 32. However, the nozzle 29 still applies adhesive in two areas as at 120 and 121 to provide a band 122 which is not covered by adhesive and which extends along the entire length of the business form string 110.

For each form length 111, there is provided a plurality of closed perimeter die cuts 124 which, as in the illustration in FIG. 1, have segments 125 overlying the band 122.

Advantageously, the bands 22 or 122 are positioned adjacent to but spaced from one side edge 138 of the liner 16, 116. A second or parallel side edge is provided at 39 or 139 with the remainder of the liner being defined by a second pair of end edges as at 40 and 41 -- see FIG. 1.

Version of FIG. 6

The version of FIG. 6 differs from that of FIG. 5 in the means for providing an area of the release liner adjacent the die cut segment which is free of pressure sensitive adhesive. This is done by removing a longitudinal strip of the base stock which carries with it the previously laid-down adhesive --avoiding the need for blanking menas 37 in the nozzle 29.

The showing in FIG. 6 again has a continuous liner ply 216 applied to the form lengths 211, 211a, 211b, etc. This again is readily achieved by passing the liner ply 216 directly from the adhesive applying unit 229 to the web W -- as by passing around idler roll 230 (see FIG. 8). Here, however, the nozzle 229 applies adhesive along the entire length and width of the release liner ply 216.

Again, for each form length 211, there are a plurality of labels 223 provided a plurality of closed perimeter die cuts 224 which have aligned, generally linear segments 225.

As before, the form length 211 is equipped with a release liner 216 as seen in FIG. 7. There, the release liner 216 has one face 217 equipped with pressure sensitive adhesive 218 and adhered to one surface 219 of the generally rectangular form length of sheet 211.

As seen in FIG. 8, the now-coupled continuous webs W and 216 follow the path P to the die cutter 233. There, the knife roll 234 in addition to cutting the closed perimeter 224 also cuts continuous longitudinally extending lines 242 and 243 -- see the bottom left of FIG. 6. This develops a strip 244 which is removed from the base stock web W and wound into a roll 245 or other means for disposal. This then leaves a band 222 of adhesive-free liner -- so both the sheet and the adhesive have longitudinally extending discontinuities.

As a consequence, there is a free edge 243 of the label 223 which can be readily engaged by a finger nail for easy peeling off of the label.

While in the foregoing specification a detailed description of the invention has been set down for

the purpose of illustration, many variations in the details hereingiven may be made by those skilled in the art without departing from the spirit and scope of the invention.

Claims

1. In a method of making a label-containing sheet wherein a continuous web is advanced along a longitudinally extending path, the method comprising the steps of

applying pressure sensitive adhesive to one face of a release liner adjacent said path,

introducing said release liner into said path and applying said release liner one face to one surface of said web,

die cutting said web in from the other surface thereof in a closed perimeter within the confines of said release liner to define a label, said die cutting including cutting a generally linear segment adapted to provide a finger engageable portion of said label the improvement characterized by providing a longitudinally-extending band of said release liner adjacent said segment free of pressure sensitive adhesive.

2. The method of claim 1 in which said adhesive applying step includes applying adhesive in two spaced areas to provide said band aligned with said web area, said cut segment being aligned with said non-covered band.

3. The method of claim 1 in which said liner is an continuous ply, transversely severing the adhesive coated ply to provide a series of liner panels, and applying said panels at equally longitudinally spaced positions on said web.

4. The method of claim 1 in which the step of applying adhesive includes delivering a split stream from transversely elongated nozzle equipped with blanking means intermediate the ends of said nozzle.

5. The method of claim 1 in which said band is provided by die cutting a longitudinally extending strip in said web adjacent said segment and removing said strip and the adhesive contacting said strip.

6. The method of claim 5 in which said die cutting step includes cutting a plurality of closed continuous perimeters arranged in longitudinally spaced, aligned relation, each having its segment abutting said strip.

7. The method of claim 1 in which said pressure sensitive adhesive applying step including

applying pressure sensitive adhesive to one face of an edge-equipped liner in two spaced-apart areas to provide a longitudinally extending, non-covered band adjacent to but spaced from said release liner one edge by delivering a split stream of adhesive from a transversely elongated nozzle equipped with blanking means intermediate the ends of said nozzle to provide said longitudinally extending band of said release liner free of said pressure sensitive adhesive.

8. The method of claim 1 in which said die cutting step includes also a pair of continuous longitudinally extending spaced cuts one of which includes said segment and defining a strip, and

continuously removing said strip and the adhesive associated therewith and discarding said strip.

Fig. 1

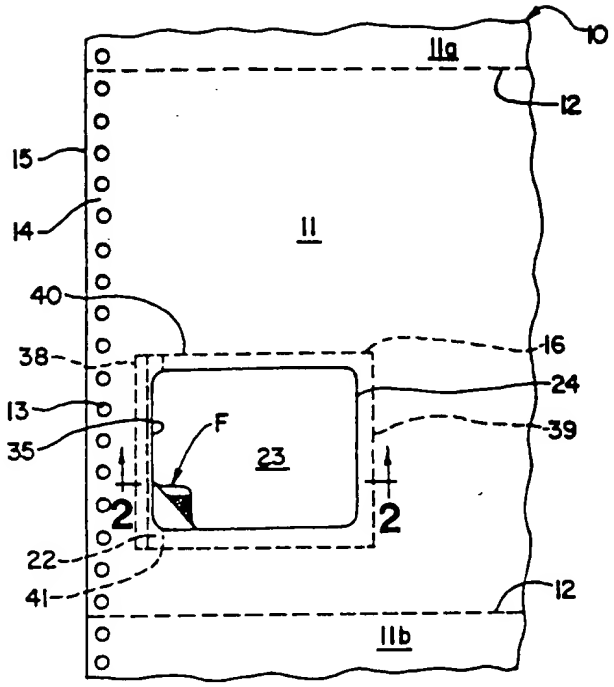


Fig. 2

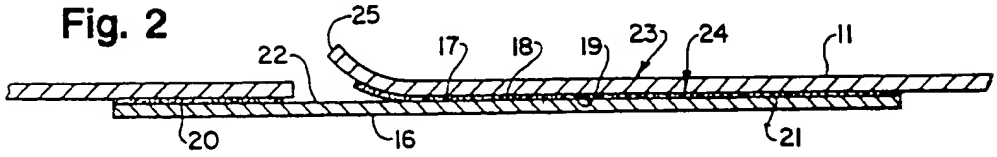
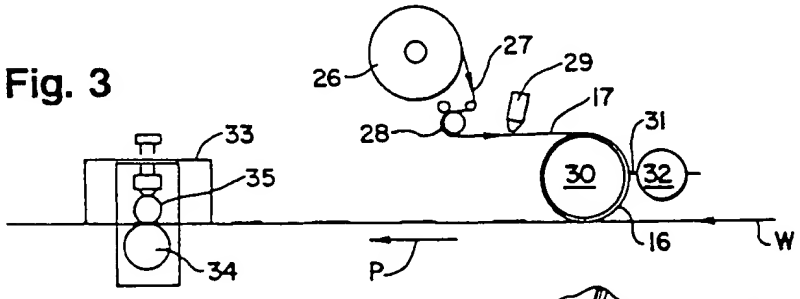


Fig. 3



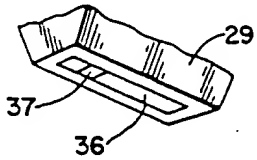


Fig. 4

Fig. 5

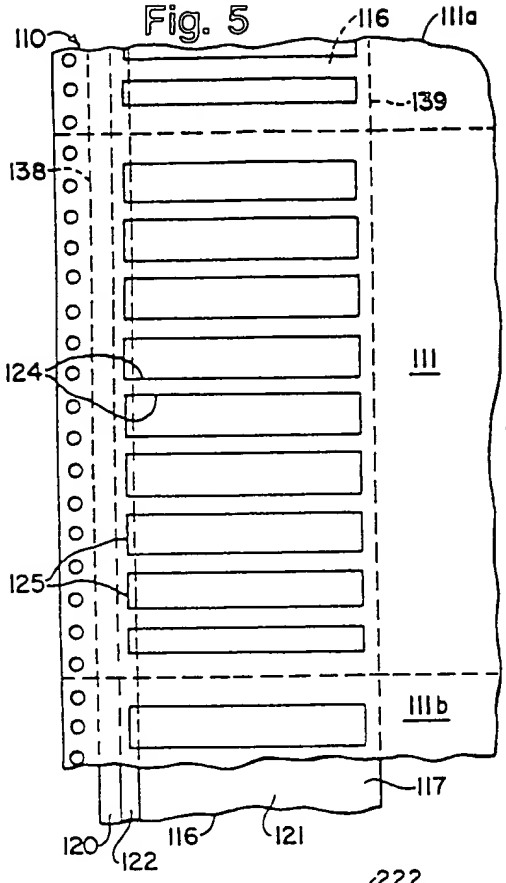
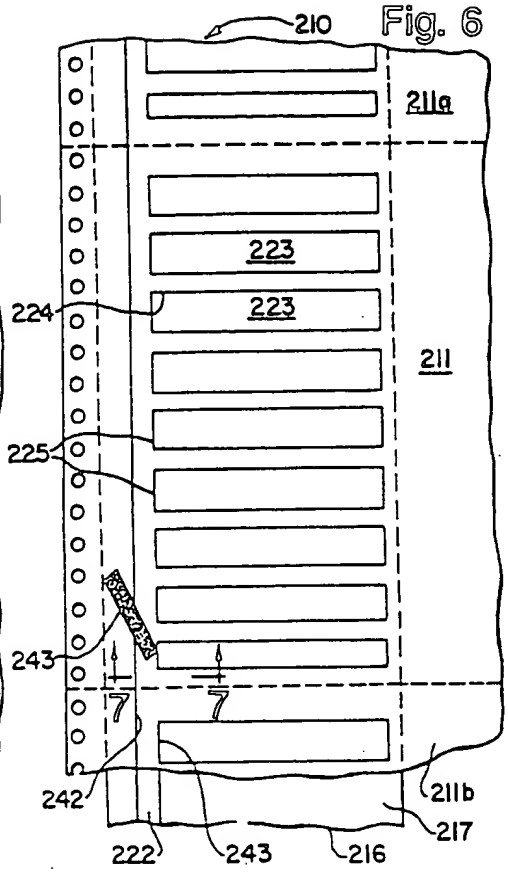


Fig. 6



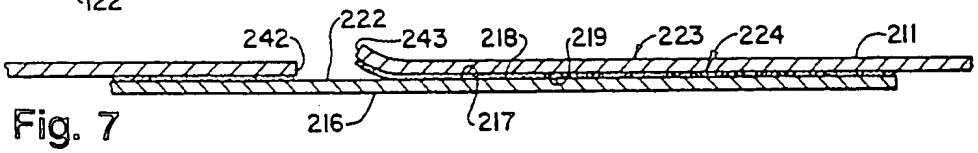


Fig. 7

Fig. 8